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MAINFRAME JOURNAL

For Users of IBM System/370 Architecture & Compatible Systems

May 1990

CICS Loves Fast Engines

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Focus On DB2

"Starting to use DB2 is a test of vision." These are the ominous words of Aaron Werman in his column "Mostly DB2" (starting on page 90). Werman goes on to describe the challenges facing the DB2 start-up user. Actually, the number of companies accepting the challenge and developing applications in DB2 is growing considerably.

A recent survey, commissioned by Kimberly-Clark Computer Services, revealed a major trend toward re-engineering existing databases to DB2 environments. Of the companies surveyed, 50 percent said they were going to change their database management system in the next five years with 39 percent converting to DB2.

One sign of the emergence of DB2 is the outstanding success of the International DB2 Users Group (IDUG). The first annual IDUG conference was held in May 1989 in Chicago with more than 700 attendees. This year IDUG will be convened again May 13-17 in Chicago and the attendance is expected to exceed 1000 DB2 users.

Because DB2 is clearly a centerpiece of IBM's strategic direction, many I/S organizations are following suit and migrating to DB2. However, according to Carlos Caballero, change and configuration control are indispensable to protect billions of dollars in software assets from obsolescence. Don't miss Caballero's article "Migrating To DB2" (starting on page 40).

Craig Mullins describes several methods of providing a proactive means of preventing DB2 performance bottlenecks before they occur in "Effective DB2 Object Monitoring Using The DB2 Catalog" (starting on page 12). Rounding out the focus on DB2 in this issue is Renee Peterson's Product Review of Compile/QMF, an enhancement tool for QMF. Compile/QMF is a new product from SableSoft, Inc. (Boulder, CO).

New User Group Formed—R/AD

A new user group was recently formed by several individuals interested in the impact of IBM's Repository and CASE announcements. The result is R/AD, the International Users Group for the Repository and AD/Cycle. R/AD's goal is to hold the first conference offering technical presentations by users concerning how to prepare for the new applications development framework established by the Repository and AD/Cycle. Howard Fosdick, one of the founders of IDUG, is president of R/AD and he reports that the first conference will take place on October 14-17, 1990 in Chicago. For further information call (312) 644-6610.

Regular Columnists

Many readers have sent in very nice compliments about the "new look" of *MAINFRAME JOURNAL*. Among the recent changes have been a new method of binding the magazine, updating the visual impact of the magazine and segmenting the articles into six job function-related categories.

Another improvement is the addition of several outstanding monthly columnists. It is an honor to have such highly regarded individuals contribute their expertise on their particular topics in *MAINFRAME JOURNAL* every month. Currently, regular columnists are Pete Clark – VSE, Phyllis Donofrio – CICS, Jon Pearkins – ISPF/PDF and Aaron Werman – DB2. The next several issues will introduce additional columnists who will regularly cover MVS, VM, IMS, data communications and other topics.

These writers are eager to tailor their columns to meet the needs of the readers of *MAINFRAME JOURNAL*. If there is a specific area or question pertaining to the topics covered by the columnists listed, jot it down and mail it to the attention of the appropriate columnist: c/o *MAINFRAME JOURNAL*, 10935 Estate Lane, Suite 375, Dallas, TX 75238.



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COVER:

Couldn't resist! Of course, the "fast engines" Jamie Tracey refers to in his article, "CICS Loves Fast Engines," are CPUs — not a classic Ferrari 250 GTO. Photo by William Kennedy.

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CICS OS/2: Baby CICS

By Bob Crownhart

Large systems have traditionally been the home of CICS with CICS pushing these systems to (and sometimes past) their capacities. It is the industry "work horse" of on-line transaction processing on large IBM and compatible mainframes.

CICS has been dominant in the smaller mainframe systems as well. CICS/DOS/VS has been heralded as the most cost-effective transaction processor on the 4300 and 9370 systems and CICS/VM is stepping up to the challenge of departmental computing and distributed transaction processing.

What about CICS for the entry-level system? What about the applications programmers who desire better performance than is usually available to development address spaces? What about productivity tools for applications programmers debugging CICS programs at the source line level? How can an enterprise employ cooperative processing without building additional computer rooms at remote locations? The answer is easy: IBM's CICS OS/2.

Capabilities And Limitations

CICS OS/2 (most recently released as version 1.2) provides most of the abilities found in CICS on the mainframe. The COBOL command level subset is rich and minimum Basic Mapping Support (BMS) with extensions is supported. VSAM Key Sequenced Data Set (KSDS), Entry Sequenced Data Set (ESDS) and Relative Record Data Set (RRDS) organizations as well as VSAM alternate index support are available (and work!) within CICS OS/2. DL/I and DB2 database access is performed with the new Distributed Program Link function shipping service. Execution Diagnostic Facility (EDF) in CICS OS/2 is a major subset of the mainframe CICS EDF and supports both COBOL/Z and C/Z applications.

Restrictions that have been in the mainframe CICS are removed within CICS OS/2. Usage of COBOL file descriptions is prohibited within a mainframe CICS program, but there is no such restriction in CICS OS/2. The user can interface to

the OS/2's Presentation Manager or Dialog Manager.

Exploitation of the local environment in CICS OS/2 enables users to accomplish what was previously impossible in the mainframe CICS environment. If porting applications from CICS OS/2 to the mainframe CICS is necessary, then restrictions of the mainframe CICS still apply.

Cooperative processing potentials abound with the advent of CICS OS/2. Accessing mainframe-resident data from the programmable work station is a milestone for cooperative processing. Transaction routing abilities give the end user of CICS OS/2 a seamless view of processing and the hardware and software required to support such an environment is relatively inexpensive.

CICS OS/2 also allows the use of source line debugging for COBOL/2 applications and offers applications developers a more productive, higher-performance environment. When compared to the facilities and products available for the CICS OS/2 workstation, traditional mainframe products for debugging CICS programs seem like technology from the Dark Ages.

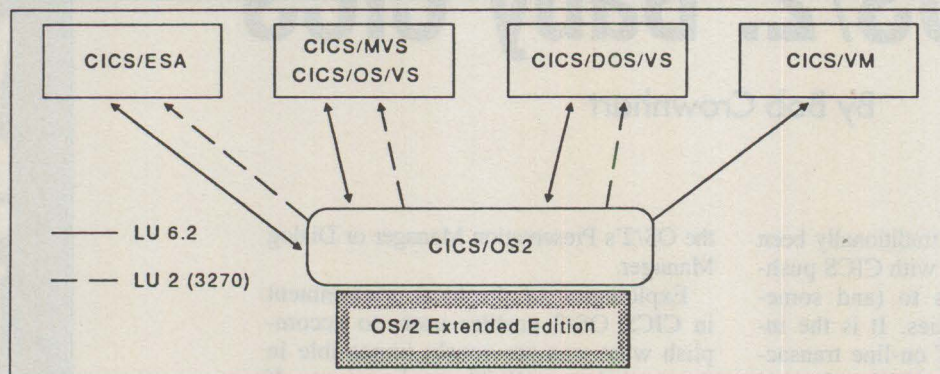
The OS/2 Environment

Surprisingly, CICS OS/2 provides the best possible functionality and performance in the OS/2 Extended Edition (EE) workstation environment. Communication facilities and potential performance are the key areas of focus.

Communication facilities in CICS OS/2 can be of two basic varieties: LU 2 (3270) or LU 6.2 (Figure 1). CICS OS/2 can utilize LU 6.2 only in the OS/2 EE environment (except for DOS workstations using NETBIOS on an OS/2 LAN). Communication via LU 2 is a one-way street because mainframe CICS cannot initiate any activity to CICS OS/2 via LU 2 communication.

LU 2 supports function shipping to mainframe CICS systems (CICS/OS/VS, CICS/MVS, CICS/ESA, CICS/DOS). VSAM, temporary storage and transient data resources resident on the mainframe

FIGURE 1



CICS are available to CICS OS/2 using LU 2 and function shipping.

In practical terms that means a VSAM data set residing on the mainframe can be read or written by CICS OS/2; batch jobs submitted by CICS OS/2 applications can be written to a remote extra-partition transient data destination residing on the mainframe CICS. Function shipping is transparent to CICS application programs.

CICS OS/2 uses 3270 data streams for transportation of non-3270 related data.

Various file transfer programs have employed the same techniques to transport entire data files between mainframes and PCs. Function shipping is at the record level.

LU 6.2 supports function shipping as described for LU 2. LU 6.2 function shipping differs from LU 2 since it performs function shipping in both directions. An illustration of this would be a mainframe CICS issuing a file control read to a VSAM data set resident at a CICS OS/2 workstation. LU 6.2 is the only method

to function ship to CICS/VM. However, CICS/VM cannot function ship to CICS OS/2 so it is a one way street to CICS/VM.

LU 6.2 additionally supports transaction routing to mainframe CICS (CICS/OS/VS, CICS/MVS, CICS/ESA, CICS/DOS/VS). Transactions best directed to a mainframe CICS system can be routed from CICS OS/2. Mainframe CICS can also route transactions to the CICS OS/2 workstation. Interconnecting CICS OS/2 workstations can also be done via LU 6.2 for transaction routing and function shipping.

CICS OS/2 supports distributed transaction processing (Advanced Program-to-Program Communication — APPC) like the mainframe CICS. Cooperative processing is now available at the workstation level.

CICS OS/2 by default provides two local terminals on the programmable workstation. While reading a remote VSAM file on one local terminal, the user can run another application on the other local terminal. If needed, the user may define additional local terminals.

In addition, up to three IBM 3151 Model 5 or 6 ASCII terminals can be connected via the communication adapters. Applications written to use 3270 BMS can be run on these devices, providing up to four users on a single workstation.

The PC DOS Environment

When PC DOS is the target operating system for CICS OS/2, limitations regarding communication and restrictions driven by the 640K memory barrier are quite evident (Figure 2). CICS OS/2 in a DOS environment supports LU 2 communication *only*. In this environment, applications are limited in size due to the DOS 640K limit; performance may be a problem; and only *one* local terminal may be defined.

LU 6.2 is possible with CICS OS/2 in the DOS environment if the DOS workstation is connected to an OS/2 LAN (Figure 2). Within this environment, communication (transaction routing, function shipping) can be initiated only when outbound from the DOS workstation. The host CICS cannot initiate activity on the DOS workstation.

Installation And Maintenance

CICS OS/2 is installed and maintained on the mainframe. CICS OS/2 is initially downloaded to one workstation and then customized. Propagation of CICS OS/2

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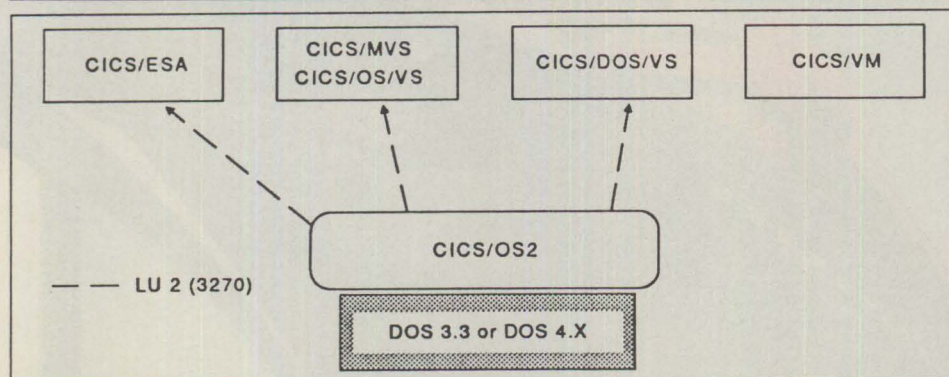


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FIGURE 2



from that workstation will usually take the form of diskettes. (Additional workstations incur additional license charges regardless of how the product is installed in them.) Distributing to users and keeping them at current maintenance levels will be no easy task! However, with the mainframe being the central point, distribution and maintenance of CICS OS/2 is far better than the typical "shrink wrapped" products that proliferate in the PC environment.

CICS OS/2 can be installed to run in four different environments:

- OS/2 Extended Edition
- DOS 3.3 or higher
- Development system
- Execution-only system.

The workstation to download CICS OS/2 initially will probably install all four varieties. Propagations from there are likely to be more specific with the development system used by those who need to compile programs, alter tables and translate BMS maps and the execution-only system used by those employing CICS OS/2 solely for production purposes.

CICS OS/2 tables are entirely resource definition on-line. Macros of any kind will not be found in CICS OS/2; hence, the recent phrase I coined — "Where macros go, nothing grows!"

Porting Applications

Most plain COBOL/VSAM applications run on mainframe CICS can be ported to the CICS OS/2 environment with little if any modification. Provided applications stay within the bounds of the CICS OS/2 subset, source compatibility will be maintained. The user will need to recompile these applications using COBOL/2 or an equivalent product.

VSAM files may be downloaded from the mainframe. First, a new conversion

table (DFHCNV) to control translation from EBCDIC to ASCII must be coded on the mainframe CICS system. Next, the user must write a small command-level program which will execute in CICS OS/2. The program will read a remotely defined file from the mainframe and write a local VSAM file that has been defined to CICS OS/2.

Porting BMS maps may be a slight problem if using a screen painter on the mainframe such as SDF from IBM. The key problem is that the BMS field names are restricted to seven characters in BMS macros. Screen painters remove that restriction. This is not a problem until the screen painter generates BMS macros to port to another environment. Suddenly the BMS macro field names are not the same as the symbolic definitions within the COBOL program.

CICS OS/2 accepts only BMS macros for application screens. CICS OS/2 abides by the BMS restriction that field names cannot exceed seven characters in length. To avoid this shortcoming, the user will need to port his BMS copybooks (symbolic COBOL definitions) as well as his source programs. He should not use the copybooks created by CICS OS/2 BMS translator if he has ported BMS copybooks from the mainframe. He will still have to use the CICS OS/2 BMS map translator to generate the CICS OS/2 equivalent of the physical map.

Cost

Without a doubt, the first objection to OS/2 and the necessary supporting hardware is the cost. OS/2 EE needs a fast processor and large amounts of memory (at least a 286 and 5MB are recommended). Several years ago, many users demanded IBM 3290 devices for their workstations. Multiple-screen (four) viewing was deemed a necessity. For that

necessity, companies paid approximately six thousand dollars for a single device!

A workstation costing between seven and 10 thousand dollars is inexpensive when the function being delivered carries the power of OS/2; 10MB is an extremely small hard drive for a PC today. For that reason, managers requiring increased productivity from the programming staff need to redefine what is too expensive for a workstation. For productivity and functionality, OS/2 EE is required.

Summary

Mainframe CICS celebrated its twentieth birthday in 1989. How appropriate that CICS finally inspired an offspring in the same year. Baby CICS is a "chip off the old block."

For 20 years, applications have turned to mainframe CICS for their on-line processing needs. CICS OS/2 addresses needs that applications planners and developers have had for years and the development environment for CICS applications at the workstation level is far superior to the mainframe environment.

Cooperative processing looms in the CICS future and CICS OS/2 may be one of the best vehicles to take the industry in that direction. Certainly OS/2 EE is a key delivery vehicle of Systems Application Architecture (SAA). It is encouraging to find CICS OS/2 as one of the ground-breaking software offerings proving that SAA can and does work.

Alternatives to mainframe CICS environments do not require throwing away the large investment an enterprise has in CICS applications and programming skills. Cooperative processing does not mean the entire programming staff has to learn the C programming language. Informed decisions and choices will bring solutions to the needs of an enterprise and its customers. CICS OS/2 broadens the choices that are available for transaction processing and offers solutions for distributing transaction processing. ☯

ABOUT THE AUTHOR

Bob Crownhart is a senior CICS systems specialist for Crownhart and Associates. He has been involved in CICS systems and applications programming for 14 years and is active in the CICS industry as both a consultant and training instructor. Crownhart and Associates, 7043 Monaco Drive S.E., Olympia, WA 98501, (206) 754-6370.